

CLAIMS

1. Process for making a copolymer of fluorinated olefin and hydrocarbon olefin selected from ethylene, propylene and mixtures thereof, the process comprising a substantially emulsifier free aqueous emulsion polymerization of said fluorinated olefin and said hydrocarbon olefin and wherein said process comprises copolymerization of said fluorinated olefin and hydrocarbon olefin in the presence of fluoropolymer particles and/or in the presence of fluorinated liquid that is in a form suitable for improving the copolymerization of said fluorinated olefin and hydrocarbon olefin.
2. Process according to claim 1 wherein said fluoropolymer particles are formed in-situ by polymerizing part of said fluorinated olefin without substantially copolymerizing said hydrocarbon olefin.
3. Process according to claim 2, wherein the fluoropolymer particles formed in-situ, amount to not more than 20% by weight of the total weight of fluoropolymer produced.
4. Process according to claim 1 wherein said fluorinated liquid is an inert fluorinated liquid or a liquid fluorinated monomer.
5. Process according to claim 1 wherein said fluoropolymer particles have an average diameter of not more than 150nm.
6. Process according to claim 1 wherein a suitable form of said fluorinated liquid is obtained by passing the fluorinated liquid through a nozzle thereby forming an aerosol or wherein said suitable form is obtained by introducing the fluorinated liquid as a gas into a polymerization kettle and allowing it to condense therein.
7. Process according to claim 1 wherein said fluoropolymer particles are provided at the initial stage of the polymerization.
8. Process according to claim 1 wherein said fluorinated olefin is selected from the group consisting of tetrafluoroethylene, vinylidene fluoride, chlorotrifluoroethylene, hexafluoropropylene and mixtures thereof.

9. Process according to claim 1 wherein said copolymer is a copolymer of said fluorinated olefin and said hydrocarbon olefin and one or more fluorinated or non-fluorinated comonomers and said process involves the copolymerization of said fluorinated olefin, said hydrocarbon olefin and said one or more fluorinated or non-fluorinated comonomers.
10. Process according to claim 9 wherein said fluorinated comonomer comprises a fluorinated vinyl ether.
11. Process according to claim 1 wherein the copolymer has a melting point of less than 200°C or wherein said copolymer is substantially amorphous.
12. Process according to claim 1 wherein said polymerization is a thermally initiated or redox initiated.
13. Process according to claim 1 wherein said polymerization is initiated with an initiator composition comprising a persulfate, a peroxide or a permanganate.
14. Process according to claim 1 wherein said copolymer contains recurring units deriving from said hydrocarbon olefin in an amount of 10 to 70 mol% relative to total amount of recurring units in said copolymer.